

15¢

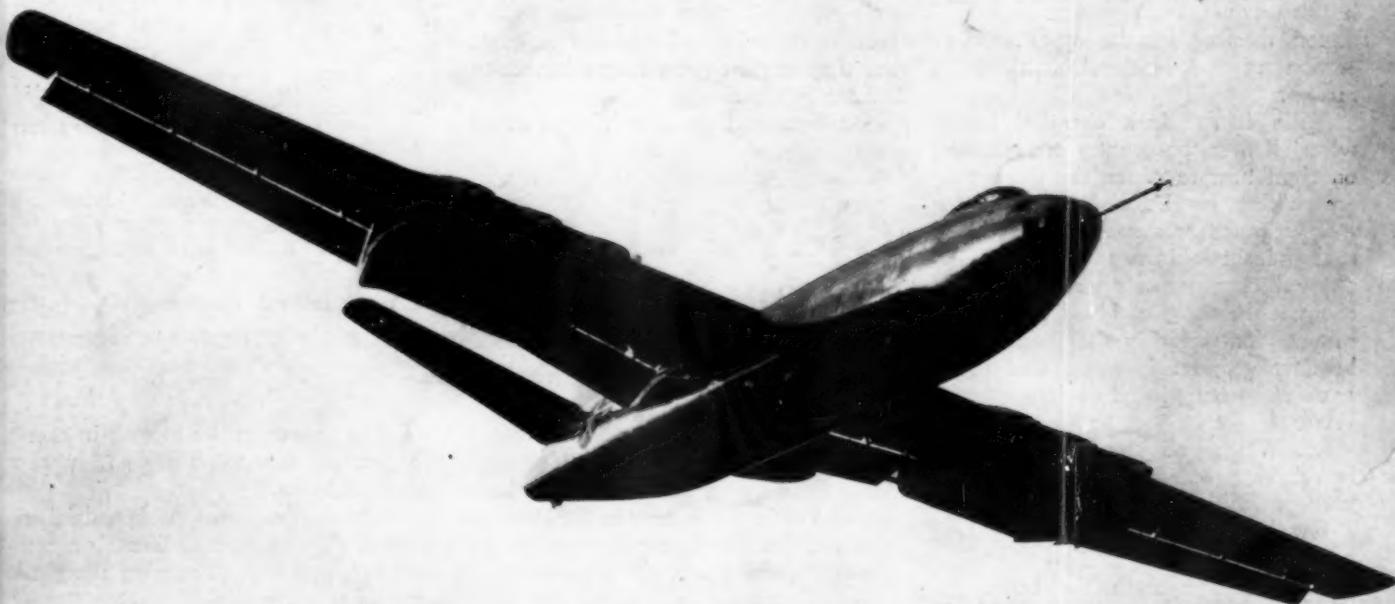
TECHNOLOGY DEPARTMENT

SCIENCE NEWS LETTER

Vol. 52, No. 14

THE WEEKLY SUMMARY OF CURRENT SCIENCE • OCT. 4, 1947

PUBLIC LIBRARY
OCT 9 - 1947
DETROIT



Six Jets

See Page 213

A SCIENCE SERVICE PUBLICATION

MEDICINE

New Use Found For Pectin

Patients with such diseases as tuberculosis and diabetes may be helped by pectin's ability to prolong antibiotic and other drug action in the body.

► PATIENTS with tuberculosis, diabetes, other gland disorders and asthma may in future be helped by a discovery of Drs. Henry Welch, Harold L. Hirsh and S. Ross Taggart of the penicillin division, U.S. Food and Drug Administration and the District of Columbia Health Department.

Pectin, they found, can slow down the rate at which penicillin, streptomycin and other drugs escape from the body. This means fewer "shots" to disturb sick patients and greater economy in the use of the drugs.

The discovery that pectin can be used in this way was announced at the Washington meeting of the syphilis study section of the National Institute of Health.

Pectin is the fruit chemical housewives all over the country are counting on right now to stiffen the jellies they are making. Just before Pearl Harbor it was suggested as a substitute for blood to fight shock in war wounded. Its physical characteristics were considered enough like those of blood to make it suitable for replacing the fluid lost in hemorrhage, and it was found to be harmless when injected into human veins.

Dr. Welch and associates turned to pectin in a search for a chemical to keep penicillin in the body longer than a few hours. Oil and wax have been used with penicillin to slow the mold remedy's escape from the body. But these substances sometimes make the "shots" of penicillin painful, sometimes cause lumps and sterile abscesses, and sometimes lead to the patient's becoming sensitized to the drug so that he cannot take any more of it.

Pectin slows penicillin's escape from the body about the same as the oil and wax but, unlike these chemicals, it does not cause pain, abscesses or any of the other troublesome complications. It has been used in penicillin treatment of 350 patients without any unpleasant reactions.

Streptomycin's escape from the body is slowed even more effectively than penicillin's by use of pectin. The anti-germ action of a one-half gram dose

can be maintained for two days (48 hours). At present, six times this amount of streptomycin must be used each day (24 hours) to treat TB patients. Cost of the drug is one limiting factor in its wider use. But if only a twelfth as much need be used, the cost can be reduced to an almost insignificant amount. Trial of streptomycin-in-pectin for tuberculosis treatment is about to start at Freedman's Hospital in Washington.

Drugs such as adrenalin and ephedrine which constrict small blood vessels also have their effect prolonged when they are combined with pectin. Study of pectin's effect on these drugs has so far been made only in laboratory animals, but they suggest great future benefit to asthma patients.

Sex hormones are now injected in oil

MEDICINE

Mayo-Like Center Founded

New Mexico foundation will have as its major interest expansion of the Lovelace clinic's cancer service and research in aviation medicine.

► A MEDICAL foundation supported by a medical clinic, like the famed Mayo Foundation and Clinic, has been established in Albuquerque, N. Mex. As a result, that city is expected to become the medical center of the Southwest.

One of the founders is Dr. W. Randolph Lovelace, II, surgeon famed for his high-altitude studies which included a 40,200-foot parachute jump to test the bail-out oxygen bottle for B-29's.

His uncles, Dr. William Randolph Lovelace, and Dr. Edgar T. Lassetter, are other founders of the new medical center. These two men 25 years ago founded the Lovelace Clinic. With their nephew, they have now given the physical assets of the clinic, valued at \$1,000,000, and its good will and name to the new foundation, which will be known as the Lovelace Foundation for Medical Education and Research. The clinic will operate henceforth as a voluntary association of salaried physicians under a

preparations. Insulin's action is slowed by giving it with protamine, a fish protein. Pectin might be used with advantage in place of the oil and the protamine, laboratory studies suggest. So far, the pectin-hormone combination has not been tried on patients.

The size of penicillin particles is important when the mold chemical is given in oil and wax, Drs. Welch and Hirsh have found in studies with Drs. Harry F. Dowling, Monroe J. Romansky, Jay A. Robinson, Velma L. Chandler and William W. Zeller of Gallinger Municipal Hospital and George Washington School of Medicine.

The original discovery that penicillin could be made more useful by giving it in oil and wax to prolong its stay in the body was made by Dr. Romansky while he was serving in the Army. At first it was thought that to use penicillin in this way, the mold chemical must be in a viscous or "solid" form. But if the penicillin particles are the proper size, the "liquid" form is just as good, Dr. Romansky and associates reported. They have devised a microscopic test for determining penicillin particle size.

Science News Letter, October 4, 1947

board of governors. Its income in excess of operating expenses will go to support the foundation.

Study of the apparent beneficial effects of Albuquerque's climate on arthritis, sinusitis and diseases of the chest, expansion of the clinic's cancer detection and treatment service, and research in aviation medicine will be major interests of the foundation.

A basic function of the foundation will be the awarding of fellowships enabling young doctors to take post-graduate training at the clinic in preparation for recognition as qualified specialists. The elder Dr. Lovelace is a member of the group that founded one of the organizations for certifying medical specialists, the American Board of Surgery. A trustee of the new foundation is dean of the University of Colorado Medical School, Dr. Ward Darling. President is Floyd B. Odlum of New York and Indio, Calif.

Science News Letter, October 4, 1947

ELECTRONICS

New Atomic Tool Built

An electron linear accelerator, newest piece of atom-smashing equipment, built and operated at Stanford University, will lead to artificial source of cosmic rays.

► A SLENDER, three-foot atom-smasher may be the forerunner of a powerful new scientific instrument for producing artificial particles as potent as cosmic rays in the laboratory.

This new tool for probing the secrets of atoms is an electron linear accelerator, built and operated at the Stanford University Microwave Laboratory. A projected larger model of the accelerator, 100 to 200 feet long, could develop a billion electron volts, Dr. William W. Hansen, director of the laboratory, told the Institute of Radio Engineers. Sections of the smaller model were shown to scientists at the West Coast Electronic Manufacturers' Association trade show in San Francisco.

Electrons, the negatively-charged outer particles of atoms, "ride" through the pipe-like tube of the accelerator on microwaves. The microwaves, invisible "eyes" of radar, are generated by a million-watt magnetron in the new atom-smasher. Dr. Hansen, who played an important role in the development of radar, predicted that a billion-watt model of the accelerator will bring high voltage energy of the order of cosmic rays

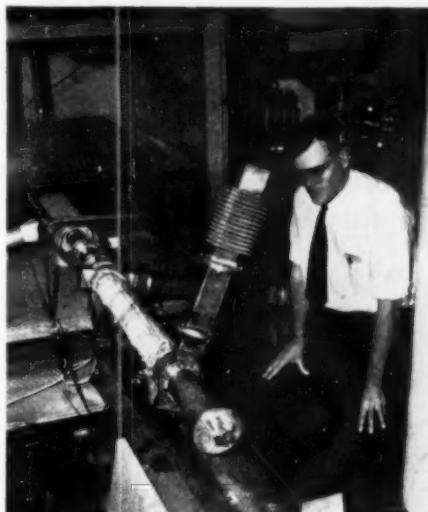
into scientific laboratories for study.

Thus far, Dr. Hansen disclosed, the three-foot accelerator has produced electrons of more than 1,500,000 volts. The instrument was built at Stanford under contract with the Office of Naval Research.

Gold-plated disks inside the tube of the atom-smasher slow down the microwaves to the speed of the slower electrons. As the electrons travel through the tube, they pick up energy which increases their mass. At one point in its lightning journey, the tiny particle weighs 2,000 times as much as it does at rest.

This new attack on the tiny bits of atoms may unlock secrets of the fundamental particles of matter. High-energy cosmic rays, mysterious particles which bombard our atmosphere from outer space, are now studied high overhead in airplanes, balloons and V-2 rockets. An accelerator for producing energies equal to that of some of this cosmic bombardment might solve some of the mysteries of the rays which we neither see nor feel but which may affect us.

Science News Letter, October 4, 1947



NEW ATOM SMASHER—Newest atom-smashing equipment in the United States, an electron linear accelerator, is being examined by its developer, Dr. William W. Hansen, director of the Stanford Microwave Laboratory.

of research along these lines, with the idea of eventually being able to track hurricanes and typhoons along their often erratic courses. The work is under the general direction of Capt. Howard T. Orville, chief of Naval Aerology. In addition to the six-station network in the Caribbean and Gulf areas, the Navy now has similar observatories on Guam and Okinawa, and is now setting one up at Sangley Point, on the island of Luzon in the Philippines.

Science News Letter, October 4, 1947

METEOROLOGY-SEISMOLOGY

Microseism Theory Tested

► THE Florida-Louisiana hurricane, because it was such a big one, gave Navy scientists an excellent chance to test out the relatively new microseismic method for tracking these tropical storms, from six observatories now in operation at Miami and Richmond, Fla., Corpus Christi, Texas, San Juan, P. R., Guantanamo, Cuba, and Swan Island in the Caribbean.

This method depends on the apparent association between big storms and tiny shiverings in the earth's crust that register themselves on seismographs, or earthquake-recording instruments. These tiny tremors, which have no known connection with the heavy shocks of true earthquakes, are known as microseisms.

A connection between microseisms and storms was vaguely noticed long

ago; it was suggested that pounding of storm-surf on the shore might cause them.

The theory was brought to a more definite focus a few years back by the Rev. James B. Macelwane, S.J., of St. Louis University, well-known researcher on earthquakes. His suggestion was that the tremors started, not on shore, but on the ocean bottom under the centers of tropical storms or hurricanes. Later he put forth the supplementary hypothesis that the mechanism that started the microseisms was a piling up of the ocean water, pushed toward the "eye" of the storm by the wide in-whirling wheel of the hurricane winds. This still remains to be proved or disproved.

The Aerological Section of the U. S. Navy has taken over the development

ASTRONOMY

German Discovers Faint New Comet in Heavens

► A NEW comet, visible only through powerful telescopes, has been discovered by a German astronomer, J. Reinmuth of Heidelberg, Germany.

The new thirteenth magnitude comet was moving north and west in the heavens when it was first discovered in the southern part of the constellation Pegasus, the winged horse. Reported to the Harvard College Observatory, Cambridge, Mass., by the European astronomical clearing house at Copenhagen, Denmark, the new discovery is called Comet Reinmuth, after the German astronomer who first spotted it.

Science News Letter, October 4, 1947

Popular "Panama" hats are made of toquilla straw from Ecuador.

MEDICINE

Oriental Blood Studied

Blood specimens of hundreds of children in three Oriental countries were collected for study of apparent immunity to poliomyelitis.

► WITH the blood specimens of several hundred children of three countries of the Orient, the fruit of a 28,000 mile air quest, a group of University of California scientists are preparing for studies which may answer one of the critical questions about poliomyelitis.

The blood specimens may show why there was an increased incidence of polio among American troops in Japan during the past polio season; and why, generally speaking, there is such an increase wherever Western European adults go into countries with poor sanitation, such as Japan, India and North Africa, without a parallel increase in the native population.

The specimens were collected by a scientific mission for the Army Epidemiological Board headed by Dr. W. McD. Hammon, University of California Medical School epidemiologist, and including Dr. J. Casals, of the Rockefeller Institute of Medical Research, Dr. Don M. Rees, University of Utah entomologist, and Dr. Gordon Meiklejohn, University of California.

Dr. Hammon says the specimens may reveal the accuracy of a medical theory which attempts to explain such an increase. This theory is that in countries with poor sanitation polio is a common ailment before the age of two, but paralysis is rare up to that age. With immunity presumably acquired by age two, there is a limited number of susceptibles to polio in the age group when the disease is likely to take the paralytic form.

In countries with improved sanitation, infants are better protected from the disease, but this results in a larger group susceptible to the paralytic form.

Dr. Hammon and his colleagues in the Hooper Foundation for Medical Research in San Francisco will study the blood specimens taken from children from six months to ten years of age in Japan, Okinawa, Korea and China to determine whether or not protective antibodies to polio are present.

If the antibodies are present immunity has been acquired. Blood of children of this age group in the United States does not show a high incidence of pro-

tective antibodies. If the incidence is high in the samples from the Orient, greater weight can be given to the hypothesis.

The scientists also collected large numbers of mosquitoes, carriers of Japanese "B" type encephalitis, and blood specimens of victims of this disease. Work with this material will be continued during the winter in Tokyo and the Hooper Foundation.

Another polio problem Dr. Hammon will study is a comparison of polio virus strains of the Orient and the U.S. Immunity to types found in the United States may not confer immunity to strains in the orient, he stated, and added that it is possible the increase in polio in the U.S. in the past two years may be due to the importation to this country of tropical strains.

Science News Letter, October 4, 1947

PHYSIOLOGY

Bone Grafts Actually Become Part of Body

► BONE GRAFTS actually live, developing their own blood supply and integrating themselves as a vital part of the body, from the time they are transplanted. Evidence for this comes from studies with radioactive phosphorus, one of the chemicals being produced in the atomic pile at Oak Ridge, Tenn. The bone graft studies were reported by Drs. Clifford L. Kiehn, Hymer L. Friedell and William J. MacIntyre of Western Reserve School of Medicine, Cleveland, at the American College of Surgeons.

Grafts from what is popularly called the hip bone, medically the iliac crest, were widely used during the war to replace jaws and other bones of the face that had been shot away. But there has been considerable controversy about whether these grafts lived immediately after transplantation or whether they died and new bone was later formed in their place.

To settle this point, the Cleveland doctors injected radioactive phosphorus which they could trace through the body to see where it was deposited in the bones. Phosphorus is one of the chem-

icals of which bones are made. In one study, they found that a bone graft from the hip, 24 hours after transplanting, had taken up radioactive phosphorus at about 60% of the amount taken up by the same weight of normal hip bone. Bone grafts that had been killed, or de-vitalized, by boiling, took up only 7% of the phosphorus as compared with normal bone.

Refrigerating bone grafts, as in bone banks, depresses the bone grafts for about a week, but after that the transplanted bone takes and lives satisfactorily.

Science News Letter, October 4, 1947

For matches a wood is required that combines straightness of grain, ease of splitting, ease of working, and toughness.

SCIENCE NEWS LETTER

Vol. 52 OCTOBER 4, 1947 No. 14

The weekly summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C., North 2255. Edited by WATSON DAVIS.

Subscriptions—\$5.00 a year; two years, \$8.00; 15 cents a copy. Back numbers more than six months old, if still available, 25 cents.

Copyright, 1947, by Science Service, Inc. Reproduction of any portion of SCIENCE NEWS LETTER is strictly prohibited. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicate services issued by Science Service.

Entered as second class matter at the post office at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C.; Pennsylvania 6-5566, and 360 N. Michigan Ave., Chicago, State 4439.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

Board of Trustees—Nominated by the American Association for the Advancement of Science: Edwin G. Conklin, American Philosophical Society. Nominated by the National Academy of Sciences: Harlow Shapley, Harvard College Observatory; Warren H. Lewis, Wister Institute; R. A. Millikan, California Institute of Technology. Nominated by the National Research Council: Hugh S. Taylor, Princeton University; Ross G. Harrison, Yale University; Alexander Wetmore, Secretary, Smithsonian Institution. Nominated by the Journalistic Profession: A. H. Kirchhofer, Buffalo Evening News; Neil H. Swanson, Executive Editor, Sun Papers; O. W. Riegel, Washington and Lee School of Journalism. Nominated by the E. W. Scripps Estate: Max B. Cook, Scripps Howard Newspapers; H. L. Smithson, Executive Agent of E. W. Scripps Trust; Frank R. Ford, Evansville Press.

Officers—President: Harlow Shapley. Vice President and Chairman of Executive Committee: Alexander Wetmore. Treasurer: O. W. Riegel. Secretary: Watson Davis.

Staff—Director: Watson Davis. Writers: Frank Thone, Jane Stafford, A. C. Monahan, Marjorie Van de Water, Martha G. Morrow, Ron Ross. Science Clubs of America: Joseph H. Kraus, Margaret E. Patterson. Photography: Fremont Davis. Sales and Advertising: Hallie Jenkins. Production: Priscilla Howe.

AERONAUTICS

Fast Jet Bombers Tested

Two six-jet-engine Army bombers, built for high speed flying, have unusual thin wings to decrease air resistance. One is capable of over 480 miles an hour.

See Front Cover

THE swept-back wings and other design features in the Army's newest jet-propelled bomber, now ready for ground and taxi tests at the Boeing Aircraft Co., in Seattle, Wash., follow the latest tested developments for speedy planes of the future.

This six-jet-engine bomber, the Army XB-47, or the Boeing Stratojet, is an experimental model to test the new in design. It is approximately the size of the B-29 Superfortress. The sharply swept-back wing and tail surfaces are ultra-thin to decrease air resistance at high speeds. Knife-blade leading edges on plane wing are conceded as essential on planes to fly at speeds approaching that of sound. Blunt leading edges develop heavy shock waves at transonic speeds which require much power to combat.

The six engines used in the Stratojet

were built by General Electric Company. They are carried under the wing surfaces, three on each wing. Two of the three are in a single housing close to the fuselage, the third is well out, relatively near the wing tip in an unusual position.

Another six-jet bomber for the Army under flight tests at the Glenn L. Martin plant near Baltimore is shown on the front cover of this week's SCIENCE NEWS LETTER. Its engines, also made by General Electric, are in banks of three under each wing. It is a long-range plane, capable of over 480 miles an hour, and can carry a bomb load of over ten tons. Its Army designation is the XB-48.

The Martin bomber has a wingspan of about 108 feet, and is 86 feet in overall length. The new Boeing bomber is 116 feet in wingspan and 108 feet in length. Both have thin wings to decrease air resistance, and both have landing wheels in tandem under the



"STRATOJET"—This is the new experimental Boeing XB-47 with six jet engines. Notice the very thin swept back wings, which it is hoped will give the plane great speed, and the position of two of the jets near the wing tips.

fuselage, and light wheels for stability under the engine.

Science News Letter, October 4, 1947

BIOCHEMISTRY

New Anti-Germ Compound Found in Radish Seed

RADISHES are responsible for the newest addition to the chemical family of antibiotics, or penicillin-like germ-checking substances. Drs. George Ivanovics and Stephan Horvath of the University of Szeged, Hungary, announce (*Nature*, Aug. 30) the discovery of an antibiotic compound in radish seed.

It will not be useful in medicine, in its present form at least, because experiments have shown it to be poisonous to animals. It has also been found highly active in preventing the germination of seeds of various kinds of plants, including cabbage and mustard, which are relatives of the radish, as well as members of the cucumber and grass families.

Because the generic name of the radish is *Raphanus*, the new antibiotic has been named raphanin.

Science News Letter, October 4, 1947

METEOROLOGY

Cloud-Height Record Made Continuously at Airports

A CONTINUOUS cloud-height record at over 42 Naval airports is now made automatically by a new photoelectric instrument developed by the Navy in cooperation with General Electric Co.

The instrument, called a ceilometer, measures the cloud ceilings over the airfield up to 10,000 feet by means of a reflected beam of light. It is an improvement over earlier similar methods in that it makes use of a modulated beam of light from a 25,000,000 candle-power projector which, being on special wavelengths, can be identified by receiving instruments. Another advantage is that it can be used in the daytime.

The apparatus obtains the height of a cloud ceiling from the ground by triangulation. The beam sent from the projector, after reflection from the base of the cloud, is received by the photoelectric detector which is at a known distance from the projector. An electric signal corresponding to the reflected light signal, and the angle at which it enters the detector, is transmitted to the airport recording machine.

Science News Letter, October 4, 1947

GENERAL SCIENCE

Science Talent Search On

Scholarships totaling \$11,000 plus 40 all-expense trips to Washington to be awarded to outstanding high school seniors throughout the nation.

► RECRUITING for leadership in the army of scientists who have come to be America's greatest hope in peace and surest shield in war is actively under way again, with the formal announcement of the Seventh Annual Science Talent Search.

A Science Talent Search is a kind of academic hurdle-race—with each hurdle higher and harder to clear than the one before it.

To begin with, the contestant has to have a good school record behind him, for a full set of his grades, together with statements by his principal or the teachers who know most about him, go to the judges along with his examination papers and essay. While no student is barred from competing, as a practical matter only seniors who are well toward the tops of their classes are likely to qualify for the finals.

Each student must complete a three-hour science aptitude examination in his own school. This is designed primarily to demonstrate his ability to master new and unfamiliar matter, and to reason out correct conclusions from clearly stated though somewhat difficult facts, rather than to find out what he has already learned or memorized.

The contestant must submit an essay of about 1,000 words on "My Science Project." This is expected to be a report on a definite project in laboratory research or field study carried on independently by the student himself.

When the judges have these three things from each entrant—student record, aptitude examination, and essay—they begin the difficult task of sifting. From the approximately 16,000 entrants, a list of 300 Honorable Mentions is first selected. These are recommended to colleges, universities and technical schools for scholarship consideration.

Then the student's ability to work and think by himself, as evidenced by his essay on his research project, is brought into the picture, and becomes an important factor in the selection of the 40 finalists who win the all-expense five-day trips to Washington.

Arriving there about the end of February, they will participate in a Science

Talent Institute, where they will meet leaders in American science and hear from them of newest research advances.

During their five days in Washington, the 40 finalists will be personally interviewed by a judging committee to determine their eligibility for the Westinghouse Science Scholarships which total \$11,000. One boy and one girl will each receive \$2,400 Westinghouse Grand Science Scholarships (\$600 per year for four years). Eight other contestants will receive four-year scholarships of \$400 each (\$100 per year for four years). Additional scholarships totalling \$3,000 may be awarded at the discretion of the judges, who are Dr. Harlow Shapley, Director, Harvard College Observatory; Dr. Harold A. Edgerton and Dr. Steuart Henderson Britt, New York City psychologists, and Dr. Rex E. Buxton, Washington psychiatrist. Drs. Edgerton and Britt are also the designers of the science aptitude examination.

Primary objectives of the Science Talent Search, as stated by Watson Davis, Director of Science Service, which administers the scholarship funds through Science Clubs of America, are:

1. "To discover and foster the education of boys and girls whose scientific skill, talent and ability indicate potential creative originality and warrant scholarships for their development."

2. "To focus the attention of large numbers of scientifically gifted youths on the need for perfecting scientific and research skill and knowledge so that they can increase their capacities for contributing to the rehabilitation of a war-dislocated world and to help the United States, with the aid of science, to lead the world to permanent peace."

3. "To help make the American public aware of the varied and vital role science plays in world affairs and in raising the standard of living."

Since 1942 a total of 240 young scientists have been named as winners of trips to the Science Talent Institute. Among this select group of 61 women and 179 men are 11 who have finished college and are now employed full time as chemists, engineers, psychologists, and

research assistants in industrial laboratories and as graduate assistants in colleges and universities.

Paralleling the national science talent search, there will also be a number of state science talent searches. In those states all students entering the national search are automatically entered also in the state search. Last year there were state science talent searches in Georgia, Louisiana, Illinois, Iowa, Tennessee and Virginia; this year there will probably be additions to the list. Winners of the state science talent searches are given recognitions of various kinds, including honorary memberships in State Academies and the American Association for the Advancement of Science, and such substantial awards as full-tuition scholarships in colleges and universities in the respective states.

Complete details of the Seventh Annual Science Talent Search can be obtained from Science Clubs of America, 1719 N St. N.W., Washington 6, D.C.

Science News Letter, October 4, 1947

GENERAL SCIENCE

Random Numbers System Devised for Indexing

► A NEW way of indexing scientific knowledge which increases many billion times the ability of a sorting card to carry and produce information was announced to the American Chemical Society meeting in New York by Calvin N. Mooers of the Zator Company, Cambridge, Mass.

Applying the mathematical principles of random numbers to this urgent problem of classifying facts of all sorts, the new Zato carding makes possible a new type of literature organization unhampered by any sort of pre-set classification.

Instead of having to devise a classification in advance that encompasses all future details, the random numbers system devised by Mr. Mooers builds its subject headings as needed and brings as many subjects as desired into mechanical relationship.

An individual scientist can use this method in arranging his research and literature notes, it was explained, or a large chemical concern can apply it to its library and information files.

"All sorts of information can be filed successfully in the same file," Mr. Mooers claimed. "The wife may even file her recipes and future social engagements in the same card file as her scientist-husband's chemical formulae without any conflict or mix-up whatever."

Science News Letter, October 4, 1947

MEDICINE

Diabetes Is Widespread

Survey revealed that for every four known cases of diabetes, three more previously undetected and unsuspected were found.

► DIABETES probably afflicts many more persons in the United States than is generally believed. Over two million persons have the disease, if figures from the latest survey apply to the nation generally.

The survey was made in Oxford, Mass., by Drs. Hugh L. C. Wilkerson and Leo P. Krall, of the U.S. Public Health Service. (*Journal, American Medical Association*, Sept. 27.)

Of Oxford's 4,983 inhabitants, 3,516 were tested. A total of 70 cases of diabetes was found. On the basis of the total population of the town, the prevalence of diabetes would be 1.7%. In other words, 17 out of every 1,000 has the disease.

For every four known cases of diabetes, three more previously undetected and unsuspected were found through the survey.

Among the 70 diabetics, 31 were men and 39 women. The median age of the known diabetics was 59.5 years, that of the new cases 55 years.

In more than a third of the cases, there was a family history of the disease. Most of the 70 reported that they had been overweight at some time in their lives.

Many of the patients with newly discovered diabetes reported symptoms common to the disease but did not know the significance of the symptoms.

Less than half of the patients who knew they had diabetes were following diet and other measures sufficient to keep the disease under control.

Among the unsuspected cases discovered in the survey was a 55-year-old mill worker whose work efficiency was reduced because of sickness, weakness and occasional numbness and neuritic pains in his hands and feet. After a fainting spell at work he was given a physical examination but no test for sugar in his blood or urine. When these tests were made in the survey, his diabetes was discovered and he is now under treatment.

The importance of early diagnosis was shown by the case of a 16-year-old boy who had no previous complaints. His

grandmother, however, had died with diabetes. The survey tests showed that his blood sugar level barely reached the minimum for a diagnosis of diabetes. But because of the family history and the tests, he is considered a potential diabetic and is now under observation and dietary treatment by his family physician.

This may be the type of case in which early discovery and prompt treatment may prevent development of the disease. The American Diabetes Association is following the case with this in mind.

Science News Letter, October 4, 1947

TECHNOLOGY

Big Fans Protect Fruit Against Frost Damage

► GIANT fans, blowing in opposite directions from rotating tops of 32-foot steel towers, are replacing the long-used smudge pots to protect the fruit from frost in America's citrus growing areas. They protect by mixing the warmer air above trees with colder air beneath.

This device, according to *Steelways*, publication of the American Iron and Steel Institute, is now in use in lemon groves near Oxford, Calif. Lemons, it is said, require greater protection against frost than oranges. The fruit is maturing throughout the year, therefore there are always tender shoots and small lemons that must be kept from freezing.

This air-mixer, one of which will protect 20 acres, is composed of two light aluminum 12-foot propellers resembling those used on airplanes, and a gasoline engine centered on the top of the cylindrical tower, the shank of the device.

The self-starter for the engine is located near the base of the tower within easy reach of the ground so that the machine can be put in operation when desired merely by pushing a button as is done with the self-starter of an automobile. The entire top, engine and fans, rotates slowly in a horizontal plane so that the artificial wind is blown in all directions.

The scheme is somewhat similar to

one used by a Maryland apple grower recently to protect his orchard from freeze. However, he used two airplanes that passed forward and back just over the tree tops in the early hours preceding daylight. The current of air from the propellers was reported to have kept the orchard air well mixed.

The wind-creating device, costing about \$3,500 per set, is stated to be cheaper than the use of smudge pots whose principal cost is for fuel oil and labor. Also it eliminates a nuisance; it creates no sooty smudge to drift into neighborhood homes. The operating cost of the wind-creator is for the labor of one man long enough to start the engines, plus the gasoline for a few hours running.

Science News Letter, October 4, 1947

CHEMISTRY

\$1,000 Award Established For Iodine Research

► IODINE, familiar first aid remedy for cuts and an important body chemical, may have still undiscovered medical uses.

To encourage and reward further research in the chemistry and pharmacy of this chemical, a \$1,000 award has been established by the Iodine Educational Bureau of New York City. The award will be given every two years through a special awards committee of the American Pharmaceutical Association.

Science News Letter, October 4, 1947



FOR FROST PROTECTION—Giant fans such as this one are replacing smudge pots to protect the fruit from frost in America's citrus groves.

VETERINARY MEDICINE

**Vaccines Found Useless
For Mexican Cattle Disease**

► EUROPEAN foot-and-mouth disease vaccines hold no hope for Mexico's afflicted cattle. The only possible remedy for the situation in that country is still total extermination and deep burial of all infected or exposed animals.

This is the verdict of Britain's foremost student of foot-and-mouth disease, Dr. I. A. Galloway of the special laboratory for the study of the malady set up at Pirbright, England.

Samples of virus from sick Mexican cattle were flown to Pirbright, and studied there in connection with the best of Europe's preventive vaccines. All were found ineffectual.

Dr. Galloway has just concluded a survey in Mexico in company with scientists from the U.S. Department of Agriculture and the Mexican Ministry of Agriculture. He has been attending a conference in Washington on the foot-and-mouth disease problems.

Science News Letter, October 4, 1947

BIOLOGY

**No Inspection System
Serves Against Germ War**

► A SILENT and sinister Pearl Harbor on a nationwide basis could be created by biological or germ warfare, Dr. Robert W. King, assistant to the president of Bell Telephone Laboratories, declared in a report to the Eighth Conference on Science, Philosophy and Religion in Philadelphia.

"If a nation is bent upon waging biological warfare," he said, "there is no form of international inspection which would be worth the paper and ink used to formalize it. Biological research and preparation need only the barest minimum of raw materials, a small personnel and very isolated laboratories and plants."

If a crippling disease or poison can be effectively broadcast in an enemy state, he said, "the atomic bomb is already well along toward being outmoded as the weapon especially to be feared."

Dislodging by the United Nations of leaders of a nation from their positions of power was recommended by Dr. King as a war prevention measure when the leaders bring their nations to war's brink in opposition to a United Nations verdict.

Scientists must remain free to discuss their discoveries whether or not these touch closely upon secret military devices and developments, Dr. King declared. The freedom of science may hinge upon the creation of a world police with elimination of national military rivalries, he told the conference.

As a means of reducing the misunderstanding among pupils studying textbooks on both sides of the iron curtain, Dr. Robert H. Lowie, University of California professor of anthropology, advocated in a conference report that "a commission of British, Russian and American scholars might unite on a formulation of historical facts that would not cause umbrage in any of the countries in question."

Practical difficulties would confront such an attempt in the United States, Dr. Lowie recognized, as the matter of historical texts is one that is constantly liable to interference by mob rule.

Science News Letter, October 4, 1947

MEDICINE

**Thirty or More Viruses
Held to Blame for Polio**

► THIRTY or more different infantile paralysis-causing viruses may exist, Dr. Robert Ward, New York University College of Medicine, pointed out at a conference on the disease held at Warm Springs, Ga.

The conference was held to commemorate the twentieth anniversary of the polio treatment center's founding by the late President Franklin D. Roosevelt.

The number of kinds of polio virus that exist is not known, Dr. Ward said. There may be as many types as there are pneumonia germs or streptococci. Pneumonia germ types number some 33, and before the sulfa drugs and penicillin, saving a patient's life often depended upon being able to give him serum of the exact type of pneumonia germ that had invaded his body.

Existence of more than one type of polio virus strain is one of the handicaps to preparing a vaccine against the disease. Another is the lack of tests for polio virus, similar to tests now available for detecting different types of pneumonia germs. To be effective, a vaccine would have to be capable of giving protection against all types of polio virus, since there is no way of knowing which type may have attacked.

"No such vaccine is available today," Dr. Ward declared.

Science News Letter, October 4, 1947

ORDNANCE

**Surplus Army Bombs Being
Buried to Preserve Them**

► SURPLUS Army bombs are being buried "alive" to preserve them, the Department of the Army revealed in Washington. Stripped of bomb parts and shipping bands, the bomb body, filled with the explosive TNT, is buried under the earth in great piles.

Before burial, all paint scale, rust and dirt are removed from the bomb. Fuze cavities are filled with a preservative, and threaded parts are covered with bandages and grease. Then the entire bomb body is coated with a special preservative.

Following this preparation, the treated bombs are stacked in as small a space as possible and covered three feet or so with earth. After the earth covering has settled, it is further compacted and covered with a waterproof blacktop similar to that used on roads. The present experimental burying ground is in northwestern Illinois.

Science News Letter, October 4, 1947

MEDICINE

**Fat from Blood May Be
Weapon Against Disease**

► A FAT from blood may become a chemical weapon of the future against encephalitis, infantile paralysis and other virus-caused diseases that attack the brain and nervous system. (*Science*, Sept. 19).

This possibility, and so far it is only a possibility, is now being investigated by Drs. J. Casals and Peter K. Olitsky of the Rockefeller Institute for Medical Research, New York.

The viruses of three kinds of encephalitis, popularly known as "sleeping sickness," are inactivated in the test tube by a fat from blood serum, the Rockefeller scientists discovered.

The fat, or fatty substance, has not yet been identified. It has been found in blood serum from mice, hamsters, rabbits and horses. Its chemical identity, the mechanism of its virus inactivation and the bearing of this on laboratory tests for viruses are now being investigated.

Science News Letter, October 4, 1947



SCIENCE FIELDS

ENGINEERING

Shortage of Engineers Predicted Until 1949-50

► ENGINEERS and scientists for American industry will continue to be in short supply well into 1949 or 1950, an industrial educator warned.

H. N. Muller, manager of the educational department of the Westinghouse Electric Corporation, Pittsburgh, declared, "All companies are short of technically trained men today."

"The competition for these men is keener than it ever was," he added.

Industrial expansion coupled with the wartime drain on schools and colleges is blamed for this postwar shortage by Mr. Muller.

Westinghouse, the official explained, is enrolling many more men in its graduate student training courses for new technical employees than it did before the war. Wages for these college graduates starting in industry are far above prewar levels, too, Mr. Muller pointed out.

Science News Letter, October 4, 1947

MEDICINE

Poison-Ivy Self-Treatment Nearly Fatal to Boy

► POISON-IVY tincture nearly killed a Philadelphia boy who used it without medical supervision in an attempt to make himself immune to the weed. The story (*Journal, American Medical Association*, Sept. 13) is told by Dr. Harry Lowenburg, Jr., of Philadelphia.

The patient was first seen in 1942 as a boy of 7. He had a distressing array of symptoms. He was treated for what seemed to ail him and showed some improvement, but continued to need treatment.

Finally in 1946 he was admitted to the Jewish Hospital with a high fever and severe gastro-intestinal symptoms including wine-colored vomit; breathing and circulation were quite abnormal. Various emergency treatments were given. His condition improved, and he was eventually discharged as cured.

When his parents were closely questioned, they told Dr. Lowenburg that for seven weeks their son had been swallowing daily doses of a commercial

tincture of poison ivy, stepping up the dose from five drops a day at the outset to 57 drops just before the crisis that sent him to the hospital. Maximum dosage for adults, as recommended by the manufacturer on the label, was five drops three times daily in half a glass of water. In his anxiety to become immune to poison ivy, he had overdosed himself to within an inch of his life.

And it all went for naught. Dr. Lowenburg adds that since his recovery, a little more than a year ago, the boy has had two severe attacks of ivy poisoning.

Science News Letter, October 4, 1947

PHYSICS

Scientists Probe Mystery Of Cosmic Particle Birth

► ONE of the mysteries of subatomic matter and energy concerns just how cosmic rays from outer space create very short-lived particles called mesons or mesotrons.

A new theory suggests scientists have been seeing only the start and the finish of the birth process, Dr. Victor F. Weisskopf of the Massachusetts Institute of Technology said in a letter to the *Physical Review*, (Sept. 15).

The whole process of producing a meson in the earth's upper atmosphere by a proton, which is a cosmic ray particle, happens very fast and the meson created lasts only a few small fractions of a second. But this time is sufficient, so Dr. Weisskopf surmises, for the proton to get into a state preparatory to meson production. This may explain why the production of a proton by a meson has not been discovered, as it should be if the process is simply reversible.

Science News Letter, October 4, 1947

PHYSICS

Five-Mile Phone Calls Carried on Light Beam

► A DEVICE for talking across one to five miles with a beam of light was disclosed in New Haven by three scientists. They said the "beam of light telephone," developed during World War II, could be used day or night. At night, infrared filters prevented the enemy from literally seeing the conversations.

The scientists are William W. Watson and Richard F. Humphreys of the Yale University Department of Physics and D. L. Woernley of the Cornell Aeronautical Laboratory, Buffalo, N. Y.

Science News Letter, October 4, 1947

CHEMISTRY

Tons of Mushrooms Wanted To Produce Antibiotic

► WANTED: mushrooms, at least two or three tons. Deliver to Miss Nancy Atkinson, Institute of Medical and Veterinary Science, Adelaide, South Australia.

Not that Miss Atkinson is that fond of mushrooms-on-toast. She has good scientific reason for wanting such a huge quantity. She has found in the common mushroom that you buy in tins or little baskets a penicillin-like drug which she states kills tuberculosis germs in a test-tube, and attacks a wider range of bacteria than penicillin itself.

Now she wants to make a sufficient quantity of her new antibiotic to try it on guinea-pigs infected with tuberculosis, and if they survive the treatment then possibly on volunteer TB patients.

The common market mushroom (*Psalliota* to botanists) was only one of more than 200 varieties of fleshy fungi in which Miss Atkinson found antibacterial activity.

Science News Letter, October 4, 1947

ASTRONOMY

"Flying Mountain" Found By California Astronomer

► A "FLYING Mountain" whirling through space at a speed of 14 miles per second has been discovered in the heavens.

The flying mountain is a new minor planet, less than 10 miles in diameter. It is millions of miles from the earth, so you will not be able to see it without a powerful telescope.

The newest-discovered minor planet, or asteroid, was spotted by C. A. Wirtanen, astronomer at the Lick Observatory, Mt. Hamilton, Calif. He found it last July as a trail on a 17-inch plate exposed in the 20-inch Carnegie astrographic telescope of the observatory.

Named Wirtanen's Object, the tiny new planet has the second closest orbit to the sun of any asteroid yet discovered. Wirtanen's Object circles the sun at a distance of 156,000,000 miles. The closest known orbit for an asteroid is that of Eros, 133,000,000 miles. The earth is 93,000,000 miles from the sun.

Like most of the more than 1,500 known asteroids, Wirtanen's Object has an orbit between Mars and Jupiter. Its closest approach to Mars is 6,000,000 miles.

Science News Letter, October 4, 1947

GENERAL SCIENCE

Youth Learns Science

High school students through the Science Clubs are cooperating with government agencies in such work as weather observation, tree study and laboratory testing.

By WATSON DAVIS

► IF YOU SEE a boy measuring the depth of water in a tin can after a very hard rain, he is a cooperator of the U. S. Weather Bureau.

If a high school girl is inspecting the trees in your neighborhood with an expert air, she is probably doing it for the U. S. Forest Service.

If a little group of young people in a basement laboratory produce unusual odors, they may be chemists of tomorrow.

These young scientists are representative of a third of a million members of Science Clubs of America who this fall are resuming hobby activities that fit in with their high school studies.

In more than 14,000 junior and senior high schools there are these science clubs, each with a couple of dozen members who have as their guide and sponsor a favorite science teacher.

In Your Region

There are such clubs in your locality. Science Service is cooperating with school officials and scientists throughout the nation in providing the information and know-how for science club organization and activities. Any teacher or interested adult who sponsors a science club can, without any cost whatever, affiliate it with the national Science Clubs of America and receive a hundred-page handbook full of data and aids to science hobby activities.

The young science enthusiasts have fun in carrying out their science projects. But what they do is very far from mere child's play.

Leading science organizations, in government, industry and elsewhere, cooperate in suggested projects. Many of the investigative tasks are of direct, practical benefit to the communities in which the science club members live.

Even FBI agents under J. Edgar Hoover have set up a scientific project in which any club can participate. A group can learn all about taking fingerprints, how to develop chemically latent

prints that can not be seen by the unaided eye, how to make up fingerprint cards that can be filed in the actual FBI files of civilian records. Secrets of examining questioned handwriting, detecting suspected paper, ink, typewriting and other markings are explained. The students of scientific criminal investigation are told how ultra-violet light is used in scientific police work. Testing of blood, firearms, identification of glass smashed in hit-and-run auto cases, and use of spectrographic methods are also included.

The cooperation of science club members by the thousands all over the nation in measurement of sudden and very heavy rainfall is used by the U. S. Weather Bureau in spotting the distribution of torrential rains that could not otherwise be recorded. Officials of the U. S. Weather Bureau have pronounced these observations an aid to future forecasting.

Human lives are saved by the studies that science club members make upon the cause and prevention of automobile accidents in cooperation with the traffic research specialists of the American Automobile Association. Young scientists test drivers to determine their driving skill, and fellow students are helped to avoid spills when they ride their bikes to and from school.

Planted Cork Oaks

Thousands of cork oak trees are now growing in the southern half of the country because science club members have aided in planting seeds and seedlings. In many instances, rare cork oak trees have been discovered growing naturally and protected so that in another national emergency our nation shall not lack this essential raw material.

One group of high school chemists became expert and advanced in complex organic syntheses. They actually set up a small business concern and manufactured in a basement laboratory in their spare time rare chemicals that were needed in the war and were being produced nowhere else.

New kinds of insects are discovered by high school entomologists and they have the privilege of giving them names that become a part of the scientific literature.

In several cases young science club archaeologists studying Indian mounds near their schools have had their scientific papers published in professional journals before they were graduated from high school.

Work Together

Often teams of scientists work up demonstrations in physics, chemistry and biology which are so effective that they take them on tour among the grade schools in the vicinity at the invitation of the teachers. Other clubs give spectacular science shows before the parent and teacher associations of their schools.

In almost every science club there is a young astronomer who is building his own telescope, a young physicist who has a radio set with which he talks to fellow "hams" in other lands, or a young mechanical engineer who is remodeling an old automobile to get better mileage or more speed out of it.

There are young chemists who know all that has been announced about atomic energy and who anticipate the next official releases with intelligent guesses. There are youngsters by the score who



YOUTHFUL ENGINEER — This Science Club member is preparing for the day when he may be designing engines for science and industry.



GEOLOGISTS IN MAKING—Young science club geologists are using microscopes to study minerals they are preparing for exhibit in a Science Fair.

are working hard on the problem that is bigger than atomic energy—the practical understanding of photo-synthesis or the way of capturing the sunshine so that it is used as stored energy.

Science Service cooperates with the science clubs by publishing the latest and most authentic news of science and club activities.

The professional scientists and teachers also do their bit to help this youth movement in science. State science academies, universities, colleges, teacher associations, museums and other organizations are cooperating.

State Science Fairs

State and regional science fairs or congresses for science club members are being held throughout the nation. The projects that are most noteworthy in the judgment of the schools are sent to these larger exhibitions where they often win scholarships and other prizes for the young scientists who did them.

Each year Science Clubs of America conducts the national Science Talent Search which culminates in the award of the Westinghouse Science Scholarships at the Science Talent Institute at Washington. This is a crowning activity of the science clubs and in many cases the seniors who participate have been working on their science hobbies during the whole six years of their junior and senior high school work.

Girls as well as boys are members of the science clubs. Most of the activities can be carried on as effectively by girls as by boys. In the Science Talent Search each year the proportion of girls who win honors is determined by the ratio of girls to boys who enter.

The science club activities of high school students have won approval from national and science leaders as a serious and important aid to the nation's science program.

America finished the war with a realization that there were not nearly enough scientists and development engineers available to discover new basic knowledge, do the necessary industrial and military research and train the oncoming scientific generation.

The report of the President's Scientific Research Board just issued recommends that by 1957 the nation should devote at least one per cent of our national income to research and development in the universities, industry and the government. This means that many thousands of scientists and engineers will be needed in addition to the number that will be trained in colleges and universities if the normal number of past years are produced.

Many of the science club members in the schools of the nation this fall are receiving their first contact with science and its possibilities. The extent to which they and their teachers develop science

club opportunities will determine to a large degree how well the urgent national need for scientists will be answered in the future.

For every club member who will become a professional scientist there are hundreds who will not. For most of the school science hobbyists, science will remain a hobby throughout life, whether they become lawyers, merchants, housewives or some other variety of the great public. For these non-professional scientists of tomorrow, the serious fun they have in science clubs is one of the richest experiences of their youth. They will be better equipped to live in a scientific world and control the results of science so that civilization will progress rather than be wiped out.

Anyone interested in science clubs can get information by writing to Science Service, 1719 N St. N.W., Washington 6, D.C.

Science News Letter, October 4, 1947

The Lincoln soybean, an American cross between Mandarin and Manchu, is the variety now mostly grown in the Midwestern soybean area; it gives a higher yield than its predecessors and has a higher oil content.



SPEEDOMAX Saves Time; Records Data Accurately

At Univ. of Minnesota, a Speedomax records skin temperature of a student eating ice cream during experiments to determine the effect of food temperature on blood flow. The instrument automatically collects data at six test points every half minute; requires none of the researcher's attention during the course of the test. Other experiments prefer faster or slower Recorders. Write for catalogs, or consult an L&N engineer for specific information.

LEEDS & NORTHRUP COMPANY 4977 STENTON AVE., PHILA. 44, PA.
TELEMETRIC • AUTOMATIC CONTROLS • HEAT-TREATING FURNACES
Jrl. Ad N-33A-243(1b)

Do You Know?

The temperature inside electric steel-making furnaces is about 3,500 degrees Fahrenheit.

Some 45 different kinds of termites have been identified on Barro Colorado island in the Panama Canal Zone.

The insecticide DDT, on a pound-for-pound basis, is claimed to be 100 times more toxic on the Japanese beetle larvae than lead arsenate.

Radio sets with clear reception on the ground go berserk at high altitudes in planes; in recent tests it was found that radios and radar are affected by unknown radiations when kept at high altitudes for more than a few hours.

A 5,000,000-ton deposit of lignite in Washington state has been proved by the U. S. Bureau of Mines; this low-grade coal-like fuel deposit can be removed by low-cost strip-mining methods and is suitable for use in special furnaces.

ARISTO CALENDAR CHRONOGRAPH



OUTSTANDING FEATURES

- First quality 17 jewel guaranteed Aristo timepiece.
- Full feature stop watch with time-out function and 12 hour register.
- Beautiful, practical, all stainless steel case.
- Automatic calendar showing month, day, and date requiring setting only once monthly.

This fine watch offered at a special discount on the regular retail list of \$117.00 plus tax. Postpaid in U. S. A. taxes included, delivered to you **\$105.60**

Other chronographs for as low as \$45.50

PRATT & MORRIS
Distributors
27 Cleveland St. Bergenfield, N. J.

GENERAL SCIENCE

Scientists' Aid Urged

British report proposes that England use her scientists to battle the present economic crisis the way she used them to help win victories during the war.

► ENGLAND should use her scientists to battle economic difficulties the way she used them to help win victories during the war, the executive committee of the Association of Scientific Workers of London declared in a report on science and the economic crisis.

Greater efficiency in coal and steel production and major gains in other industries are predicted if Britain turns her scientists to the present crisis.

Turning at least one-third of the scientific manpower, laboratories and equipment of Great Britain's armed forces to civilian production is one step proposed by the committee.

Other urgent proposals for British science in the economic crisis are:

The addition of three scientific and three technical members to the advisory Planning Board to the Cabinet.

Drafting of a plan for utilization of science and technology in British industry and agriculture.

Even more extensive pooling of scientific research and development in essential industries than was done during the war.

Formation of regional research councils.

Representation of scientific and technical workers on existing production committees.

Here is the way the committee believes science can help England close the critical gap between exports and imports:

More efficient use of coal would mean more coal. Raising the average efficiency of coal utilization from 20% to 25% would add 50 million more tons of coal each year.

Oxygen used instead of air speeds steel production. Work on this has been done in both Russia and the U.S. Other savings in steel could come from more careful calculations of stresses, from standardization and from closer contact between producers and users.

Waste products in the chemical, metal, brick and cement industries should be turned back into raw materials. Timber, bricks and cement could be saved by developing the pre-stressed reinforced and cellular concrete used on a large

scale in Sweden's industries.

New mass production methods should be developed.

"There is no reason why we should not use mass production methods of our own just because our markets are too small to use those of the U.S.A.," the statement says.

Research in transportation operation is needed. And science in agriculture can go far toward making Britain self-supporting in food, the committee states.

Charging that science has been neglected in the economic crisis in England, the group urges a new effort to muster science for the war of dollars.

Science News Letter, October 4, 1947

Although 15 species of timber are cut in Maine sawmills, nearly 92% of that cut for lumber is white pine, spruce and hemlock.

SEE the GAMES CLEARLY, IN COMFORT, WITH The TRANSMISSION KIT

Save 50% of the cost of a high quality television set by assembling your own set with the Transmision Kit. Absolutely no technical knowledge needed. Our simple instructions guide you. The kit is complete with sight and high fidelity sound reproduction, 7" picture tube; sharp, stable picture.

Kit CONTAINS ALL PARTS, including antenna. No other parts to buy . . . Also available, Kit with 12" Picture Tube. Prices amazingly low.

See it at your local radio dealer . . . or write to:

Transvision, Inc., 387 North Ave., New Rochelle, N. Y.

THE SCIENTIST IN ACTION

by
W. H. GEORGE

A SCIENTIFIC STUDY OF HIS METHODS

This book is for those who need to do ORIGINAL thinking. CLEAR thinking. THINKING WITH A PURPOSE. Helps you to DISCOVER ideas, tells you how to DEVELOP them! Explains clearly METHODS OF WORKING to get RESULTS.

M. O. WELLS writes to the author . . . I took up your book about a quarter to eight. At nine my parlour maid came to ask if I wanted any dinner tonight. It is now close on to midnight. But I realize now that your book is of the UTMOST IMPORTANCE and I feel tremendously lit up by it . . . Now respectively yours,
H. G. Wells

CHOICE OF 44th BRITISH SCIENTIFIC BOOK CLUB AND AMERICAN SCIENTIFIC BOOK CLUB

354 Pages • Price \$3.00 • Postage free.
5-DAY MONEY-BACK GUARANTEE
At All Bookstores, or from

Emerson Books, Inc., Dept. 32 D, 251 W. 19th St., N. Y. 11

WAR SURPLUS OPTICAL BARGAINS

ASSEMBLE YOUR OWN BINOCULARS!

Save More Than $\frac{1}{2}$ Regular Cost

Complete Optics!

Complete Metal Parts!



ARMY'S 6 X 30 BINOCULARS

No Carrying Case with any Sets shown below. M-13A1 sets are waterproof model. M-3 sets are not waterproof. Limit—1 Set to a Customer on all Sets shown below.

COMPLETE OPTICS & METAL PARTS—Model M-13A1, 6 x 30 Binoculars. Everything you need—ready for assembly. When finished will look like a regular factory job costing \$102 to \$120. The Optics are new, in perfect or near-perfect condition. Have new low reflection coating. Metal Parts are new and perfect, all completely finished. No machining required. Bodies factory hinged and covered. Complete assembly instructions included.

Stock # 830-Q \$40.00 Postpaid,
plus \$8.00 tax—Total—\$48.00

COMPLETE OPTICS & METAL PARTS—Model M-3, 6 x 30 Binoculars. The Optics in this set are new, perfect or near-perfect. Prisms have new low reflection coating. Factory mounted Eye Piece and Objective Assemblies not coated. Metal Parts are perfect, new, ready for assembly. When finished, this

GOVERNMENT'S 7 X 50 BINOCULARS

Here's an unusual opportunity to secure a fine set of Binoculars at a substantial saving of money. Offered here are complete sets of Optics and Metal Parts for the 7 x 50 Binoculars. These components are new and all ready for assembly. We supply full instructions. Limit—1 set of Metal Parts and 1 set of Optics to a customer.

METAL PARTS—Set includes all Metal Parts—completely finished—for assembly of 7 x 50 Binoculars. No machining required. Bodies factory hinged and covered. A sturdy Binocular Carrying Case is optional with each set of Metal Parts. Stock # 842-Q \$39.40 Postpaid,
plus \$4.80 for Case Total \$44.20

OPTICS—Set includes all Lenses and Prisms you need for assembling 7 x 50 Binoculars. These Optics are in excellent condition—perfect or near perfect and have new low reflection coating. Stock # 5102-Q—7 x 50 Optics \$25.00 Postpaid

NOTICE: Add 20% Federal Excise Tax to your remittance if you buy both the Binocular Optics and the Binocular Metal Parts.

ARMY'S 6 X 30 BINOCULARS

will look like a regular factory job, except a name has been filed off a cover plate. No machining required. Bodies factory hinged and covered. Stock # 831-Q \$35.00 Postpaid,
plus \$7.00 tax—Total—\$42.00

METAL PARTS ONLY—Model M-13A1, 6 x 30 Binoculars. No Optics. Same Metal Parts as described for Stock # 830-Q.

Stock # 832-Q—6 x 30 Metal Parts \$25.00 Postpaid

OPTICS FOR 6 x 30 BINOCULARS (No Metal Parts.) Perfect and low reflection coated.

Stock # 5130-Q \$15.00 Postpaid

SAME OPTICS AS ABOVE—Coated—but slight seconds.

Stock # 5124-Q \$12.75 Postpaid

If you buy both the Binocular Optics and the Binocular Metal Parts, your purchase becomes subject to 20% Federal Excise Tax. Be sure to add amount covering tax to your remittance or your order cannot be filled.

Optics and Metal Parts are Available for Monoculars ($\frac{1}{2}$ a Binocular). For Complete Details, Write for Bulletin # 14-Q.

Set #1-Q—Our Advertising Special—15 lenses for \$1.60 Postpaid, plus 10-page idea booklet. For copying, ULTRA CLOSE-UP SHOTS, macrophotography, experimental optics, magnifying and for making a two power f/16 Telephoto Lens, "Dummy Camera," Kodachrome Viewer, DETACHABLE REFLEX VIEWFINDER for 35 mm. camera, stereoscopic viewer, ground glass and enlarging focusing aids, TELESCOPES, low power Microscopes and for many other uses.

NEW 50-PAGE IDEA BOOK "FUN WITH CHIPPED EDGE LENSES"

Contains wide variety of projects and fully covers the fascinating uses of all Lenses in set listed above... only \$1.00 Postpaid.

35 MM KODACHROME PROJECTING LENS SET—Consists of 2 Achromatic Lenses for projecting, plus 2 Condensing Lenses and a piece of Heat Absorbing Glass with directions.

Stock # 4029-Q \$3.10 Postpaid

35 MM KODACHROME PROJECTING LENS SET—Consists of Achromatic Lens for projecting, plus a Condensing Lens and a piece of Heat Absorbing Glass with directions.

Stock # 4025-Q \$1.95 Postpaid

\$15.00 BUYS A \$500.00 TELESCOPE WITH BIG 3" OBJECTIVE



3 power instrument, brand new, with plastic Optics and fixed focus. 23" long. Wt. 31 lbs. Wide field of view. Stock # 929-Q \$15.00 f.o.b. Chicago, Ill. (Shipping Wt. about 70 lbs.)

LENS CLEANING TISSUE—1st quality, sheet size 11" x 7 $\frac{1}{2}$ ". Made to Gov. specs. Won't dust. Free of abrasives and lint.

Stock # 721-Q 500 sheets \$1.00 Postpaid

ORDER BY SET OR STOCK NO.

NEVER HAS THERE BEEN SUCH A
SENSATIONAL BARGAIN
AS THIS!
BUBBLE SEXTANT
Type A-10



These Army Air Forces Bubble Sextants cost the Govt. about \$125.00 each. A real bargain at our price of \$12.50! Included with Bubble Sextant shipment is wooden Carrying Case, 5 spare waxed paper discs, flashlight with rheostat for night use (uses ordinary flashlight cells—not furnished) aux. 2-power Galilean Telescope, Allen wrench, 1 spare marking point. Wartime used, but where necessary completely repaired, collimated and put in good working order. Light bulb has been tested—Bubble is in working condition. Because of wartime use, we make this guarantee: If not satisfied that Sextant is exactly as represented, return within 10 days and money will be refunded. Full directions for use accompany each shipment.

Stock # 924-Q \$12.50 Postpaid

Same SEXTANT as above, but new with Automatic Electric Averaging Device and illuminated Averaging Disc for nighttime use. Govt. cost \$217. We have checked Bubble and Collimation and guarantee perfect working order.

Stock # 933-Q \$22.50 Postpaid

CONDENSING LENSES—Seconds, but suitable for Enlargers and Spotlights.

Stock # 1061-Q, .6 $\frac{1}{2}$ " dia., 9" F.L. \$2.50 Postpaid
Stock # 1082-Q, .4 $\frac{1}{2}$ " dia., 6 $\frac{1}{2}$ " F.L. 70¢ Postpaid

We Have a Limited Quantity of Condensing Lenses—seconds—ranging from 4 $\frac{1}{2}$ " to 8 $\frac{1}{2}$ " in dia. with various focal lengths. Send for Free Bulletin titled "MISCELLANEOUS CONDENSING LENSES—Q".

POLARIZING VARIABLE DENSITY ATTACHMENT FOR BINOCULARS



An amazingly effective unit for controlling amount of light reaching your eyes. Cuts down glare in sky and overwater observations. Easily snapped on and off over the eye cups of American-made 7 x 30 Binoculars. Govt. cost, \$8.30 each.

Stock # 20,000-Q \$2.00 Postpaid

Above Polarizing Attachment also adaptable to Govt. 6 x 30 Binoculars with substitution of special eye-cups.

Stock # 20,010-Q, 6 x 30 Eye-cups, 75¢ pr., Postpaid

SPECTROSCOPE SETS . . . These Sets contain all Lenses and Prisms you need to make a Spectroscopic, plus FREE 15-page Instruction Booklet.

Stock # 1500-Q—Hand Type \$3.45 Postpaid

Stock # 1501-Q—Laboratory Type \$6.50 Postpaid

RAW OPTICAL GLASS . . . An exceptional opportunity to secure a large variety of Optical Pieces both Crown and Flint glass (seconds) in varying stages of processing. Many prism blanks.

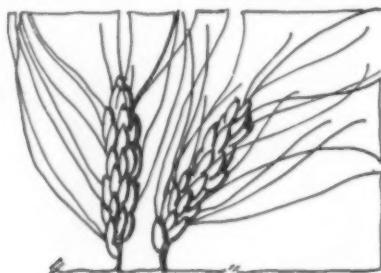
Stock # 703-Q—8 lbs. (min. wt.) \$5.00 Postpaid

Stock # 702-Q—1 $\frac{1}{2}$ lbs. \$1.00 Postpaid

WE HAVE LITERALLY MILLIONS OF WAR SURPLUS LENSES AND PRISMS FOR SALE AT BARGAIN PRICES. WRITE FOR CATALOG "Q"—SENT FREE!

SATISFACTION GUARANTEED

EDMUND SALVAGE COMPANY, P. O. Audubon, New Jersey



Trace or Tracer?

► **RADIOACTIVE ISOTOPES**, mostly generated in the atomic pile, have become such common items of scientific traffic that the term "tracer elements" has become familiar not only to physiologists but to the newsreading public at large. At the same time another term, "trace elements" has also become rather common property. The natural result has been a certain amount of confusion on the part of persons who keep up with scientific progress but who are themselves not professional scientists.

The distinction is really pretty easy, as a rule. Fortunately, both terms are in everyday English, so that there is no danger that confusion in tongues will increase confusion of concepts.

A tracer element is simply one that can be traced. This is usually (and most easily) done by employing a radioactive variety, or isotope, of one of the commoner, non-radioactive elements. For example, scientists who want to trace the course of common salt through

the blood and body tissues of an animal make up a little salt in which either the sodium, or the chlorine, or both, are radioactive. They can do the same kind of thing with calcium and phosphorus in calcium phosphate, one of the principal constituents of bones. Or with radioactive carbon in carbon dioxide which they "feed" to plant leaves. Afterwards, Geiger counters, electroscopes or other instruments for detecting radioactivity tell where the tracer elements have gone, and in what abundance.

Some tracer elements are not radioactive, but are tracked in other ways. In this class are heavy oxygen, double-weight hydrogen or deuterium, etc. But the most popular tracer elements just now are the radioactive ones, because tracing them is so easy.

Trace elements have been known and studied a little longer than tracer elements. They are elements that show up in ordinary chemical analyses of animal or plant tissue in such small quantities that formerly analysts never bothered to express their presence in percentages of a total, as they did for the more abundant elements like calcium or potassium or phosphorus or carbon or oxygen. These they would tabulate; then at the bottom of the table would list such things as zinc, boron, copper and manganese, with the word "trace" opposite each.

Later, biochemists and physiologists discovered that though all they could find of elements in this list of chemical Cinderellas were "just traces," these micro-quantities were absolutely necessary to the health of plants and animals, sometimes to their very lives. So now some of these trace elements are also being used as tracer elements, for it has become highly important to know where they go in plants and animals, and what happens to them.

Science News Letter, October 4, 1947

YOUR HAIR AND ITS CARE

By O.L. Levin, M.D. and H.T. Behrman, M.D.

Two medical specialists tell you what to do to save and beautify your hair, stimulate healthier hair growth, and deal with many problems, as:

Dandruff — gray hair — thinning hair — care of the scalp — baldness — abnormal types of hair — excessive oiliness — brittle dryness — hair falling out — infection — parasites — hair hygiene, etc., etc.

"A worthwhile book full of important information." — Ohio State Medical Journal.

Price \$2.00, incl. postage, 5-day Money-Back Guarantee
EMERSON BOOKS, Inc., Dept. 975-C, 251 W. 19th Street, New York 11

by interfering with the synthesis in the body of compounds essential to the growth of bacteria.

In cancer it would work like this: About 10 of the amino acids essential to formation of both normal and cancer tissue must be obtained from the diet because the body cannot synthesize them.

Prof. Greenberg suggests withholding those aminos and slipping the body an overdose of chemically similar antagonistic compounds. This would pull the wool over the enzymes' eyes because they cannot distinguish between the two. They would spend all their time trying to synthesize the antagonist, thus interfering with further cancer formation.

Prof. Greenberg believes adoption of this principle should bring some order out of the chaos of thousands of compounds proposed for fighting cancer and give a guiding principle for selection.

Prof. Greenberg reports that his studies on the subject are incomplete but are being continued.

Science News Letter, October 4, 1947

Now! Get COPIES of Anything, in a Jiffy!

... Right in your own office! New low-cost, error-proof method saves time, typing, drafting and checking



Letters, blue prints, pictures, contracts, valuable papers, financial data, charts, clippings (over 100 others)

Make accurate permanent copies of anything at 1-a-minute speed—for less than the price of a phone call! No darkroom or technical knowledge needed. Anyone can operate APÉCO—"America's Most Widely Used Photocopy Equipment!" Get full information, TODAY!

MAIL COUPON NOW
for this FREE book

AMERICAN PHOTOCOPY EQUIPMENT CO.

2849 N. Clark St., Dept. NL107, Chicago 14, Ill.

Send, without obligation, your 20-page illustrated book on Photocopying and its savings in time, money and labor.

NAME _____

COMPANY _____

TITLE _____

ADDRESS _____

CITY & STATE _____

Books of the Week

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C. Ask for free publications direct from issuing organizations.

ANNUAL REPORT FOR YEAR ENDED MAY 31, 1947—National Foundation for Infantile Paralysis, Pub. No. 68, 86 p., paper, free from 120 Broadway, N. Y. 5, N. Y. An account of the purposes and accomplishments in research, education, and medical care in the field of poliomyelitis.

COMBAT SCIENTISTS—Lincoln R. Thiesmeyer and John E. Burchard—*Little, Brown & Co.*, 412 p., illus., \$5.00. Third in a series "Science in World War II," the history of the Office of Scientific Research & Development, which records the wartime scientific achievements of engineers, medical men, and scientists.

DR. KIRKBRIDE AND HIS MENTAL HOSPITAL—Earl D. Bond—*Lippincott*, 163 p., \$3.50. Biography of Thomas Story Kirkbride, a Quaker doctor, and his experimental work a hundred years ago in the city of Philadelphia at the Pennsylvania Hospital for mental patients.

EDUCATION IN NICARAGUA—Cameron D. Ebaugh—U. S. Office of Education, Bulletin 1947, No. 6—*Govt. Printing*, 56 p., paper, 20c. Another one of a series of basic educational studies prepared under

the auspices of the U. S. Dept. of State as a part of the program of cultural cooperation.

FUNDAMENTALS OF PSYCHIATRY—Edward A. Strecker—*Lippincott*, 4th ed., 325 p., illus., \$4.00. Completely revised edition of an authoritative textbook covering symptoms, method of examination, etiology, treatment and prognoses of psychoses, with emphasis on relationship between psychiatry and general medicine.

GENERAL BOTANY LABORATORY BOOK—Edward M. Palmquist and Loren C. Petry—*Saunders*, 174 p., illus., paper, \$2.25. Procedures for elementary laboratory work in general botany outlined.

THE MOSQUITOES OF ILLINOIS (Diptera, Culicidae)—Herbert H. Ross—*Ill. Natural History Survey Div.*, Bulletin Vol. 24, Article 1, 96 p., illus., paper, 50c. Technical report on 52 species in Illinois, detailing their habits and presenting identification descriptions so that effective mosquito control programs can be established.

NEW WEAPONS FOR AIR WARFARE—Joseph C. Boyce, ed.—*Little, Brown & Co.*, 292 p., illus., \$4.00. Second of a

series on the history of the Office of Scientific Research & Development, describing the development and improvement of guided missiles, proximity fuses, and fire-control equipment.

OUTLINE OF ANTHROPOLOGY—Melville Jacobs and Bernhard J. Stern—*Barnes & Noble*, 332 p., paper, \$1.25. A comprehensive survey of contemporary anthropology concisely written and prepared as an introductory text.

PLACER MINING FOR GOLD IN CALIFORNIA—Charles Volney Averill—*Calif. Dept. of Natural Resources, Div. of Mines*, Bulletin 135, 377 p., illus., paper, \$2.00. Various methods and equipment used in placer mining described together with laws governing it and location of areas being worked.

SOILLESS GROWTH OF PLANTS—Tom Eastwood—*Reinbold*, 2nd ed., 277 p., illus., \$4.75. Revised and enlarged edition of 1938 book by Carleton Ellis and M. W. Swaney. Semi-technical information and practical directions presented for guidance of either professional grower or hobbyist in the field of hydroponics.

THE U. S. FIGHTS CANCER: the Cancer Program of the National Cancer Institute—*Nat. Inst. of Health, Bethesda, Md.*, 19 p., paper, free. Information on the history, research work and control program of the National Cancer Institute.

Science News Letter, October 4, 1947

PRECISION MICROSCOPES

for Students, Teachers,
Hobbyists, Laboratories

Available now at
only **\$29.50**

This is an American-made instrument—designed and produced by optical experts to exacting standards of quality and performance. Only modern production methods could bring this microscope to you at the low price of only \$29.50.

POWERFUL

Magnification from 65 to 200 diameters with 2 achromatic objectives.

PRECISION LENSES

Optically ground lenses which give a wide, flat field with sharp resolution.

EASY TO USE

Tilting device for comfortable, easy desk or lab table work.

PRECISE FOCUSING

Rack and pinion adjustment provides precise focusing movement.

HIGH QUALITY MIRROR

Optical glass, high quality concave mirror with special swivel to meet all light conditions.

STAND

Large Stand with 3½" x 3½" stage.

PROFESSIONAL MICROSCOPE MAGNIFICATION 75x to 400x

This new, versatile, achromatic microscope embodies all the optical and mechanical necessities found in higher priced instruments. It is designed to bring within reach of every one, a powerful, precision instrument capable of handling most microscopic jobs. It has excellent resolving power in a range from 75x to 400x and is brought to you at an amazingly low price.

1. Fully corrected achromatic objectives.
2. Exacting coarse and fine pinion adjustments.
3. Large, heavier stage with rotating diaphragm turret with six (6) different size apertures including one for dark field illumination.
4. Removable spring clips.
5. Heavily chromeplated metal parts.

Available in 3 ranges of magnification:

| | | |
|---------------------|-----------------------|---------|
| MODEL G-1 | 75x to 150x | \$42.50 |
| MODEL G-2 | 75x to 300x | \$47.50 |
| MODEL G-3 | 75x to 400x | \$52.50 |

Accessories:

Wood Carrying Case for any of the above \$6.50.
Two polarizing discs for color study or organic crystals, fitting any model \$3.25 per set.

WRITE FOR FULLY DESCRIPTIVE LITERATURE

A. DAIGGER & COMPANY

serving laboratories for over 53 years

159 W. Kinzie Street

Chicago 10, Illinois



• New Machines And Gadgets •

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C. and ask for Gadget Bulletin 382. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

• ELECTRONIC control maintains the temperature of electrically heated ovens within 0.1 degree Fahrenheit. It consists of an electronic adjustment of the input power of the oven, and works on a continuous flow of power rather than in "on-off" cycles.

Science News Letter, October 4, 1947

• ELECTRIC foot-warmer for use in bed is designed to give an even warmth of 105 degrees to the foot of the bed during the night. Its 36-by-17-inch cover is of sanforized cotton with a rough finish so that it will always stay in place between the top sheet and first blanket.

Science News Letter, October 4, 1947

• SAILBOATS for racing and pleasure, made of fiberglas-reinforced plastic, are eight and one-third feet long and carry a 15-foot mast with a 45-square-foot sail. The hull is made of cotton duck laid on both sides of a fiberglas mat, all bonded with a resin by heat-treatment.

Science News Letter, October 4, 1947

• GASKET CEMENT, for automotive, airmotive and wide industrial uses, provides permanent sealing, flexibility and ease of eventual dismantling. It is a synthetic, flexible, deoxidized rubber cement that does not blow out under high pressure and does resist vibration and shock.

Science News Letter, October 4, 1947

• HARMONICA, made of injection-molded plastic, has only 14 pieces instead



of some 150 pieces in the ordinary wood and metal instrument. The reeds of the instrument are molded in two pieces of 20 reeds each, all in correct pitch. The lever, shown in the picture, shifts from the diatonic to the chromatic scale.

Science News Letter, October 4, 1947

• VHF TRANSMITTER unit, for a lightplane radio, is claimed by the manufacturer to provide private planes with the advantages of very high frequency (VHF) transmission.

Science News Letter, October 4, 1947

Question Box

AERONAUTICS

How many jets do the new bombers have? p. 213.

ELECTRONICS

What new instrument will make available an artificial source of cosmic rays? p. 211.

GENERAL SCIENCE

How can scientists help in the fight against the economic crisis? p. 220.

What do science clubs do? p. 218.

Photographs: Cover, Glenn L. Martin Co.; p. 211, Stanford University; p. 213, Boeing Aircraft Co.

Where published sources are used they are cited.

What is the Science Talent Search? p. 214.

MEDICINE

How does pectin, the jelly-stiffener, aid patients with such diseases as tuberculosis and diabetes? p. 210.

How many people have diabetes? p. 215.

What do scientists hope to learn from the blood of Oriental children? p. 212.

METEOROLOGY-SEISMOLOGY

What is the microseism method? p. 211.

TO SCIENCE SERVICE

1719 N St., N. W.
Washington 6, D. C.

Enter my membership to THINGS OF SCIENCE for 12 exciting blue boxes of specimens. My \$4 check for one year is enclosed. Start with the housing materials unit of six museum-quality specimens (now ready).

Just initial here _____

OK _____

1719 N St., N. W.
Washington 6, D. C.

THINGS OF SCIENCE
12 EXCITING BLUE BOXES OF SPECIMENS
\$4 FOR ONE YEAR
ENCLOSURE
NAME
ADDRESS
CITY
STATE
ZIP CODE